I Claim:

1. A process for forming a multilayer three-dimensional structure, comprising:

(a) forming a layer of at least one material on a substrate that may include one or more previously deposited layers of one or more materials;

(b) repeating the forming operation of "(a)" one or more times to form at least one subsequent layer on at least one previously formed layer to build up a three-dimensional structure from a plurality layers;

wherein the forming of at least one layer, comprises:

(1) supplying a substrate on which one or more successive depositions of one or more materials may have occurred;

(2) supplying a multi-cell mask, wherein each cell is separated from other cells by a material, wherein the cells of the mask comprise independently controllable electrodes, and wherein a pattern of dielectric material extends beyond the cell electrodes for contacting the substrate and for forming electrochemical process pockets when such contact is made;

(3) bringing the multi-cell mask and the substrate into contact such that electrochemical process pockets are formed having a desired registration with respect to any previous depositions and providing a desired electrolyte solution such that the solution is provided within the electrochemical process pockets; and

(4) applying a desired electrical activation to at least one desired cell electrode, to the substrate, and to any other desired electrode or electrodes, such that a desired material is selectively deposited onto the substrate.

2. The process of claim 1 wherein there is no other desired electrode or electrodes that are to be activated.

3. The process of claim 1 wherein at least a portion of the dielectric material that extends beyond the cell electrodes comprises a conformable material.

4. The process of claim 1 wherein the applying results in electroplating of the desired material on to the substrate.

5. The process of claim 1 wherein the formation of the three-dimensional structure comprises at least the deposition of two different materials during the formation of at least a portion of the plurality of layers.

6. The process of claim 1 wherein a plurality of the cells of the multi-cell mask comprise an electrodepositable material that may be deposited during the applying operation.

7. The process of claim 1 wherein the formation of a desired pattern of material on a given layer comprises a plurality of selective deposition operations using the multi-cell mask wherein at least a portion of the depositions utilize a cell whose deposition position is offset between at least two deposition operations.

8. The process of claim 7 wherein at least a portion of the offsets of a cell result in locating the cell to a deposition position that partially overlaps a previous deposition position associated with a previous registration of the cell.

9. The process of claim 7 wherein the cell is made active when located at a portion of its deposition positions and is inactive when located at a portion of its deposition positions on a given layer.

10. The process of claim 9 wherein a resolution of a layer is better than that of a net area defined by the locations at which a given cell is positioned during the formation of a layer.

11. The process of claim 7 wherein the cell is made either inactive or active when located at each deposition position to which it is located during deposition of a given material during formation of a given layer.

12. The process of claim 11 wherein a resolution of a layer is substantially defined by a net area defined by the locations at which a given cell is positioned during the formation of a layer.

13. The process of claim 7 wherein at least a portion of the offsets of a cell result in locating the cell to a deposition position that is substantially in registration with a deposition position from a previous registration of the cell on the given layer.

14. The process of claim 7 wherein at least a portion of the offsets of a cell result in locating the cell to a deposition position that does not substantially overlap a deposition position from a previous registration of the cell on the given layer.

15. The process of claim 1 wherein the multi-cell mask comprises a plurality of rectangular cells laid out in a rectangular grid.

16. The process of claim 15 wherein the rectangular cells are square.

17. The electrochemical fabrication process of claim 1 wherein, the operation of at least a portion of the cells of the multi-cell mask is tested by electroplating material using the mask and examining the resulting depositions.

18. The electrochemical fabrication process of claim 17 wherein any cells found to be faulty are labeled and the use of any faulty cells is avoided.

19. The electrochemical fabrication process of claim 6 wherein deposition from cells is tracked.

20. The electrochemical fabrication process of claim 6 wherein at least are portion of the cells are redressed by replenishing their electrodeposition material.

21. The electrochemical fabrication process of claim 20 wherein any electrochemical deposition material remaining in cells to be redressed is removed prior to replenishment of the electrodeposition material.

22. The electrochemical fabrication process of claim 7 where a planarization process occurs between at least two offsets prior to deposition thickness reaching a desired deposition thickness for the layer.

23. A process for modifying a substrate, comprising:

(a) supplying a substrate on which one or more successive depositions of one or more materials may have occurred;

(b) supplying a multi-cell mask, wherein each cell is separated from other cells by a material, wherein the cells of the mask comprise independently controllable electrodes, and wherein a pattern of dielectric material extends beyond the cell electrodes for contacting the substrate and for forming electrochemical process pockets when such contact is made;

(c) bringing the multi-cell mask and the substrate into contact such that electrochemical process pockets are formed having a desired registration with respect to any previous depositions and providing a desired electrolyte solution such that the solution is provided within the electrochemical process pockets; and

(d) applying a desired electrical activation to at least one desired cell electrode, to the substrate, and to any other desired electrode or electrodes, such that a desired material is selectively deposited onto the substrate.

24. The process of claim 23 wherein there is no other desired electrode or electrodes.

25. A multi-cell mask, comprising a plurality of independently controllable cells, wherein each cell is separated from other cells by a material, wherein the cells of the mask comprise independently controllable electrodes, and wherein a pattern of dielectric material extends beyond the cell electrodes for contacting a substrate and for forming electrochemical process pockets when such contact is made.

26. An apparatus for forming a multilayer three-dimensional structure, comprising:

(a) a substrate on which one or more successive depositions of one or more materials may have occurred;

(b) a mask having multiple cells, wherein each cell is separated from other cells by a material, wherein the cells of the mask comprise independently controllable electrodes, and wherein a pattern of dielectric material extends beyond the cell electrodes for contacting the substrate and for forming electrochemical process pockets when such contact is made;

(c) a computer controlled stage for bringing the multi-cell mask and the substrate into contact such that electrochemical process pockets are formed having a desired registration with respect to any previous depositions and providing a desired electrolyte solution such that the solution is provided within the electrochemical process pockets;

(d) at least one power supply for applying desired electrical power to the substrate, to selected cell electrodes, and to any other electrodes required to cause selective deposition onto the substrate;

(e) at least one computer programmed for repeatedly controlling the stage, for controlling selected cell electrodes, and for controlling the supply of power from the power supply to cause selective deposition onto the substrate to deposit at least portions of a plurality of layers of material on previously formed layers when forming a desired structure from a plurality of layers.

27. The apparatus of claim 26 wherein there are no other electrodes.

28. An apparatus for modifying a substrate, comprising:

(a) a substrate on which one or more successive depositions of one or more materials may have occurred;

(b) a mask having multiple cells, wherein each cell is separated from other cells by a material, wherein the cells of the mask comprise independently controllable electrodes, and wherein a pattern of dielectric material extends beyond the cell electrodes for contacting the substrate and for forming electrochemical process pockets when such contact is made;

(c) a stage for bringing the multi-cell mask and the substrate into contact such that electrochemical process pockets are formed having a desired registration with respect to any previous depositions and providing a desired electrolyte solution such that the solution is provided within the electrochemical process pockets;

(d) at least one power supply for applying desired electrical power to the substrate, to selected cell electrodes, and to any other electrodes required to cause selective deposition onto the substrate;

(e) at controller for controlling selected cell electrodes and for controlling the supply of power from the power supply to cause selective deposition onto the substrate to deposit at least a portion of a layer of material onto the substrate.

29. The apparatus of claim 28 wherein there are no other electrodes.